PSTA Fact Sheet

What is PSTA?

PSTA is an acronym for "Periphyton-based Stormwater Treatment Area", which is a treatment system in which periphyton is a significant component. Periphyton is an assemblage of algae, phytoplankton and other microscopic organisms that collectively remove phosphorus from the water.

How is it different from our existing Stormwater Treatment Areas (STAs)?

While periphyton is present in all of our STAs, PSTA systems have unique construction requirements. PSTA requires removal of the existing organic soil or covering it with a layer of crushed limerock in order to prevent the reflux of phosphorus out of the existing soil. It also is acknowledged that PSTA is better suited for lower phosphorus concentrations, and hence, is considered suitable only in the downstream end of a treatment system.

Why are we investigating PSTA?

Research indicates that PSTA systems have the potential to reduce phosphorus concentrations close to or below 10 ppb, which is the proposed phosphorus criterion for the Everglades. Optimizing treatment performance is critical, since each ppb reduction results in thousands of pounds per year that don't enter the Everglades. While these results are promising, values of 10 ppb have only been observed in small-scale short-term projects. Data from larger-scale PSTA treatment systems suggest PSTA may reduce phosphorus down to a sustained concentration of 12-15 ppb. In addition, because of the requirement to cover organic soil with about 2 feet of crushed limerock, construction expenses add approximately $31,000 per acre to the overall cost of constructing an STA. However, these costs may be reduced if a shallower limerock cap is found to provide adequate, or if scraping down to bedrock is feasible.

What research has been conducted on PSTA?

The South Florida Water Management District has conducted extensive research on PSTA, and has progressed from small-scale proof of concept studies to 5-acre field scale studies. To date, the District has spent millions on PSTA research. Results are summarized in the annual *Everglades Consolidated Reports* and are available on-line at the District's website. The District plans to continue these investigations.

In addition, the US Army Corps of Engineers is investigating PSTA at two scales:

Mesocosm – 10-ft by 100-ft flow-ways

Field scale – Miami-Dade county S-332D detention area adjacent to Everglades National Park

Is PSTA included in the *Conceptual Plan*?

Yes! The Conceptual Plan recommends continuing to investigate measures, including PSTA, to further reduce phosphorus levels entering the Everglades. **As these measures are demonstrated to be feasible for reducing phosphorus, it is the intent to incorporate them through an adaptive implementation process as needed to achieve the phosphorus reduction goals.**

What is the next step for PSTA?

The Conceptual Plan is based on adaptive implementation of scientific results and contemplates additional treatment measures may be required. Because of the promising initial results both the District and the Corps of Engineers will continue investigating this promising treatment technology. In addition, opportunities exist to implement large demonstration projects in STA-1East and STA-3/4, both of which are still under construction. The District will implement a demonstration project in STA-3/4, and we have requested that the Corps of Engineers build a demonstration project in STA-1East and offered financial assistance for the project.